What is Claimed:

1.   A system for determining a patient's motor threshold level for stimulation of the patient's motor cortex for use in transcranial magnetic stimulation of the patient, comprising:

a stimulation magnet that generates transcranial magnetic stimulation (TMS) fields for application to the patient;

a transcranial magnetic stimulation (TMS) stimulator that outputs stimulation signals for causing said stimulation magnet to generate TMS fields;

a sensing device that detects a change in the patient's condition indicative of motor threshold during application of the TMS fields and outputs sensed signals; and

a detector responsive to said stimulation signals and said sensed signals to determine if a detected change in the patient's condition indicative of motor threshold is induced by a stimulation signal and to output a correlation signal indicative of correlation of the detected change and the stimulation signal.

2.   A system as in claim 1, further comprising a signaling device that signals an operator of the TMS stimulator whether the detected change and the stimulation signal were correlated.

3.   A system as in claim 1, further comprising a search algorithm responsive to a correlation output of said detector, said search algorithm determining a next stimulation signal to be applied to said stimulation magnet by said TMS stimulator so as to cause convergence of said TMS fields to a motor threshold level.

4.   A system as in claim 3, further comprising a stimulator controller responsive to an output of said search algorithm to generate a stimulator control signal for application to said TMS stimulator so as to cause said TMS stimulator to generate, without operator intervention, the next stimulation signal to be applied to said stimulation magnet.

5.   A system as in claim 4, wherein said TMS stimulator includes said detector, said search algorithm and said stimulator controller.

6.   A system as in claim 1, wherein the sensing device comprises a motion detector that detects motion of the patient or a specific muscle group of the patient induced by application of a TMS field.

7.   A system as in claim 6, wherein the motion detector includes at least one of physical motion sensors, optical motion sensors, ultrasonic motion sensors, and radiofrequency motion sensors.

8.   A system as in claim 1, wherein the sensing device comprises direct motor evoked potential (MEP) measurement devices that measure induced neurological voltage in the patient as a result of application of a TMS field to the patient.

9.   A system as in claim 8, wherein the MEP measurement devices comprise an electromyography system that measures induced neurological voltage in the patient and said detector comprises a signal processing system that correlates a measured induced neurological voltage with a stimulation signal from said TMS stimulator.

10.   A system as in claim 8, wherein the TMS field is applied to the dorsolateral prefrontal cortex (DLPFC) of the patient and MEP measurement devices measure a resulting evoked potential caused by stimulation of the DLPFC.

11.   A system as in claim 1, wherein the sensing device comprises EEG leads placed on a forehead of the patient so as to measure left/right asymmetry changes in a subset of the EEG leads.

12.   A system as in claim 1, wherein the sensing device comprises an autonomic response detector that detects autonomic responses correlated with stimulation of the motor cortex.

13.   A system as in claim 12, wherein said autonomic response detector comprises at least one of a skin conductivity detector, a respiration modulation detector, and a reflex response detector.

14. A system as in claim 1, wherein said detector comprises at least one of a correlator and an adaptive filter that correlates detected change in the patient's condition indicative of motor threshold with the stimulation signal to determine whether the detected change in the patient's condition indicative of motor threshold was induced by application of the TMS field generated in response to the stimulation signal.

15. A system for determining an appropriate stimulation location for transcranial magnetic stimulation of a patient, comprising:

a stimulation magnet that generates transcranial magnetic stimulation (TMS) fields for application to the patient;

a transcranial magnetic stimulation (TMS) stimulator that outputs stimulation signals for causing said stimulation magnet to generate TMS fields;

a probe that measures depth of cortical tissue at a treatment site and outputs a measurement signal;

a detector responsive to said stimulation signals and said measurement signal to determine neuronal excitability; and

a processor that determines cortical depth at a therapy location and calculates a treatment stimulation level at the therapy location using a neuronal excitability and the measured cortical depth of cortical tissue.

16. A system as in claim 15, wherein said processor calculates the treatment stimulation level (MT) as a product of a neuronal excitability index (NE) and the measured cortical tissue depth (Depth) at the treatment site, where MT = NE * Depth.

17. A system as in claim 15, wherein the probe is a localized ultrasound probe that measures attenuation levels or reflections from a cortical surface.

18. A system as in claim 17, wherein the probe comprises angled transmit and receive transducers that measure attenuation levels or reflections of RF signals from a cortical surface.

19. A system as in claim 15, wherein the probe is a localized impedance probe whose Q factor changes with tissue loading so as to detect cortical depth.

20.   A system as in claim 15, wherein the probe comprises a coil and detection circuit having a Q factor that changes with tissue loading so as to detect cortical depth.

21.   A method of determining a patient's motor threshold of the patient's motor cortex for use in transcranial magnetic stimulation of the patient, comprising the steps of:

generating stimulation signals for causing a stimulation magnet to generate transcranial magnetic stimulation (TMS) fields;

generating TMS fields in response to said stimulation signals for application to the patient;

detecting a change in the patient's condition indicative of motor threshold during application of the TMS fields and outputting sensed signals; and

determining if a detected change in the patient's condition indicative of motor threshold is induced by a stimulation signal and outputting a correlation signal indicative of correlation of the detected change and the stimulation signal.

22.   A method as in claim 21, further comprising the step of signaling an operator of TMS stimulation equipment whether the detected change and the stimulation signal were correlated.

23.   A method as in claim 21, further comprising the step of determining a next stimulation signal to be applied to said stimulation magnet by said TMS stimulator using a search algorithm so as to cause convergence of said TMS fields to a motor threshold level.

24.   A method as in claim 23, further comprising the step of generating a stimulator control signal for application to said TMS stimulator so as to cause said TMS stimulator to generate, without operator intervention, the next stimulation signal to be applied to said stimulation magnet.

25.   A method as in claim 21, wherein the detecting step comprises a step of delaying after a change in stimulation level to allow a stimulating capacitor to charge and/or discharge to achieve a selected stimulation level.

26.   A method as in claim 21, wherein the detecting step comprises a step of detecting motion of the patient induced by application of a TMS field.

27.   A method as in claim 26, comprising the additional step of measuring motion of the patient at multiple treatment sites to isolate muscle groups for which motion is induced by application of said TMS field.

28.   A method as in claim 21, wherein the detecting step comprises the step of measuring induced neurological voltage in the patient as a result of application of a TMS field to the patient.

29.   A method as in claim 28, wherein the measuring step comprises the step of measuring induced neurological voltage in the patient using an electromyography system and said determining step comprises the step of correlating a measured induced neurological voltage with a stimulation signal.

30.   A method as in claim 29, wherein the TMS fields generating step comprises the step of applying the TMS fields to the dorsolateral prefrontal cortex (DLPFC) of the patient and said measuring step comprises the step of measuring a resulting evoked potential caused by stimulation of the DLPFC.

31.   A method as in claim 21, wherein the detecting step comprises the steps of placing EEG leads on a forehead of the patient and measuring left/right asymmetry changes in a subset of the EEG leads.

32.   A method as in claim 21, wherein the detecting step comprises the step of detecting autonomic responses of the patient and said determining step comprises the step of correlating autonomic responses with stimulation of the motor cortex.

33.   A method as in claim 21, wherein said determining step comprises the steps of using at least one of a correlator and an adaptive filter to correlate detected change in the patient's condition indicative of motor threshold with the stimulation signal and determining whether the detected change in the patient's condition indicative of motor threshold was induced by application of the TMS field generated in response to the stimulation signal.

34.   A method of determining an appropriate stimulation level for transcranial magnetic stimulation of a patient, comprising the steps of:

generating stimulation signals for causing a stimulation magnet to generate transcranial magnetic stimulation (TMS) fields;

generating TMS fields in response to said stimulation signals for application to the patient;

measuring a depth of cortical tissue at a treatment site and outputting a measurement signal; and

determining if a measured depth of cortical tissue at the treatment site correlates to a treatment level determined using motor threshold measurement at the motor cortex.

35.   A method as in claim 34, further comprising the step of determining neuronal excitability.

36.   A method as in claim 35, wherein said determining step comprises the step of calculating a treatment stimulation level at the treatment site using the determined neuronal excitability and measured cortical tissue depth at the treatment site.

37.   A method as in claim 36, wherein said calculating step comprises the step of calculating the treatment stimulation level (MT) as a product of a neuronal excitability index (NE) and the measured cortical tissue depth (Depth) at the treatment site, where MT = NE * Depth.

38.   A method as in claim 34, wherein the measuring step comprises the step of measuring attenuation levels or reflections from a cortical surface.

39.   A method as in claim 38, wherein the measuring step comprises the step of measuring attenuation levels or reflections of RF signals from a cortical surface using angled transmit and receive transducers.

40.   A method as in claim 34, wherein the measuring step comprises the step of measuring cortical depth using a localized impedance probe whose Q factor changes with tissue loading to detect cortical depth.

41. A method as in claim 34, wherein the measuring step comprises the step of measuring cortical depth using a coil and detection circuit that measure cortical depth by accurately measuring loading of said coil during application of a TMS field in a region including the coil.

42. A method as in claim 34, wherein the measuring step comprises the step of measuring impedance changes or filling factor differences when an impedance probe is placed at the treatment site.

43. A method as in claim 42, comprising the further steps of transmitting a radiofrequency pulse to the treatment site and observing absorbed power compared to absorbed power at a known cortical depth.